

WHAT IS CLAIMED IS:

1 1. A power supply for driving opposing corona chargers
2 comprising:

3 a pair of transformers on the power supply, each of the
4 transformers providing an output;

5 a current sense element attached to each of the
6 transformers;

7 a current regulation circuit that is responsive to each of
8 the current sense circuits in accordance with a predetermined
9 parameter to adjust current flowing through the transformers;

10 a voltage monitoring circuit for each of the transformers;
11 and

12 a voltage control circuit that is responsive to the output
13 voltage monitoring circuit to limit the transformer voltage to
14 less than a predetermined value.

1 2. The power supply of claim 1 wherein the current
2 regulation circuit is a DC-to-DC converter that responds to the current
3 sense circuit by adjusting the transformer voltage.

1 3. The power supply of claim 1 wherein the current sense
2 circuit is configured to sense voltage from the transformer secondary.

1 4. The power supply of claim 3 wherein the current sense
2 circuit that is configured to sense voltage from the transformer
3 secondary senses a voltage developed by the flow of current through
4 an element in the series with the transformer secondary.

1 5. The power supply of claim 1 further comprising a clock
2 generation circuit that provides synchronized clocks of opposite
3 polarities to the transformer creating AC outputs to the transformers.

1 6. The power supply of claim 5 wherein each of the
2 transformers have a pair of primary coils that are electrically
3 connected to opposite phases of the clock generation circuit.

1 7. The power supply of claim 6 wherein both the
2 transformers have the primary coils receiving opposite clocks phases
3 such that the transformer secondary coils are synchronized to provide
4 opposing AC outputs.

1 8. The power supply of claim 1 further comprising a current
2 signal conditioning circuit connected to each of the current sense
3 elements.

1 9. The power supply of claim 1 wherein the current
2 regulation circuit is a DC-to-DC converter that can be programmed to
3 regulate current through a range by adjusting the transformer voltage
4 and also programmed responsive to the voltage monitoring circuit to
5 limit the transformer voltage.

1 10. A power supply for driving a corona charger comprising:
2 a pair of outputs to the power supply;
3 at least one current sense element connected to the power
4 supply;

5 at least one voltage monitoring circuit connected to the
6 power supply; and

7 a DC-to-DC converter that is programmed to regulate
8 current through a range of loads in response to the current sense
9 element and also programmed as a voltage limiting device for
10 the power supply.

1 11. The power supply of claim 10 further comprising a clock
2 generation and inverter circuit connected to the power supply to
3 provide synchronizing and opposing AC outputs.

1 12. The power supply of claim 11 wherein the current sense
2 element is configured to sense voltage from the transformer
3 secondary.

1 13. The power supply of claim 12 wherein the current sense
2 element that is configured to sense voltage from the transformer
3 secondary senses a voltage developed by the flow of current through
4 an element in the series with the transformer secondary.

1 14. The power supply of claim 10 further comprising a
2 current signal conditioning circuit connected to the current sense
3 element.

1 15. A method for supplying power to a corona charger to
2 regulate current without exceeding voltage limitations comprising the
3 steps of:

4 providing a pair transformers driven at their input to have
5 opposite phases of an AC signal;

6 connecting a programmable regulator to the transformers
7 output to apply a DC voltage level at the transformers output;

8 sensing current being sourced through the transformers
9 by circuitry operatively connected to the transformers inputs
10 and the programmable regulator;

11 adjusting the DC voltage level provided by the
12 programmable regulator at the transformer output in response to
13 the sensing step;

14 sensing voltage applied to the transformer output; and

15 responding via the programmable regulator to limit
16 voltage applied to the transformers output in excess of a
17 predetermined amount.

1 16. The method of claim 15 wherein the step of connecting
2 further comprises connecting a DC-to-DC converter as the
3 programmable regulator, and the DC voltage level applied by the
4 regulator is responsive to sensed current from the transformers to keep
5 current flowing through the transformers constant.

1 17. The method of claim 16 wherein the step of connecting
2 further comprises responding to voltage sensed at the transformer
3 output to limit the transformer output voltage to a predetermined
4 amount.

1 18. The method of claim 17 wherein the step of connecting
2 further comprises the DC-to-DC converter being programmed to
3 regulate current through a range by adjusting the transformer voltage.